vocation to stand as interpreters and users of scientific discoveries on one hand, and as discoverers of the fundamental scientific problems of the industry on the other. Although these tasks may now appear to be drawn on a larger canvas, they are really not very different from those which were apparent to Turner fifty years ago. In the absence of men willing to accept these challenges, much of the new knowledge must lie unused.

Perhaps Turner's greatest gift to glass technology was the *Journal of the Society of Glass Technology*. It was natural that Volume 1 should be confined to the topics of immediate interest in 1917. As well as the papers on sands for glass making, there were articles on the actions of chemical reagents on glass surfaces, the annealing of glass and refractory materials. The *Journal* continued to appear in the original format until 1960 when it was decided to split it into two parts which came to be called *Glass Technology* and the *Physics and Chemistry of Glasses*, the first devoted chiefly to manufacturing processes and the second to the study of glasses as materials. To mention only a few titles taken at random from the 1965 volumes, *Glass Technology* contained papers on the corrosion of refractories, furnace operation, devitrification and batch reactions, while subjects included in *Physics and Chemistry of Glasses* were the diffusion of sodium ions in silicate glasses, the interpretation of the infra-red spectra of boron oxide and alkali borate glasses, the volume relaxation of zinc chloride glass and the densification of glass at very high pressure.

It is fortunate that frequently the subject matter of the two new journals appears to overlap, for although their division has proved to be advantageous in most respects, no opportunity should be lost to remind readers that the use of the fundamental sciences to understand the properties of this fascinating class of materials will not make its full impact on the technology unless specific attempts are made to use the results of the laboratory and theoretical investigations. Individuals who have both a knowledge of the science of the materials and of the needs of the technology are necessary to ensure the full achievement of the research work. These were the kind of people whom Turner had in mind when he invented the term "glass technologist".

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BOOK REVIEWS

ASTRONOMY OLD AND NEW

Vistas in Astronomy

Vol. 7: Prehistory, Spectroscopy, Statistics, Evolution. Pp. vii+208. 84s. net. Vol. 8: Aspects of Stellar Evolution. Edited by Arthur Beer and K. A. Strand. (Proceedings of a conference held in honour of Ejnar Hertzsprung at Flagstaff, Arizona, June 22–24, 1964.) Pp. xii+232. 100s. net. (London and New York: Pergamon Press, Ltd., 1966.)

STONEHENGE and Callanish have made us realize that Neolithic society contained an *élite* of astronomers. Not only did they understand the sequences of Sun and Moon rising and setting at varying points on the horizon, and the relation of star rise times to the solar time throughout the year; they were able also to relate eclipses occurring many years apart, and to predict further occurrences. So say the latest computations of Hawkins (*Nature*, **202**, 1258; 1964) and of Hoyle (*ibid.*, **211**, 424; 1966). We are left to worry about the means of transmitting numerical information from generation to generation, and some may be led to doubt that any astronomical significance at all should be attached to these megaliths. Might it not be mere chance that the number of holes in the Stonehenge ring is 56, the first integer close to a multiple of the eclipse cycle of 18.6 years? Is there really anything but chance in the various sighting lines, apart from the well known midsummer Sun rising?

The eclipse prediction may be debatable, but the presence of the sighting lines must now be undeniable. Prof. Thom, in the most important contribution to Volume 7, *Vistas in Astronomy*, gives an analysis of more than one hundred sites in Britain with standing stones in rings, or lines, or related to distant prominent peaks or islands. The intersection of the sighting lines with the horizon defines the declination of a rising or setting heavenly body, and Prof. Thom has shown that these declinations are grouped astonishingly well around those of the Sun at equinoxes and solstices, and of the bright stars, at an epoch near 1800 B.C. The accuracy is such that there are separate groupings on the left and right limbs of the Sun; such precision allows one to date the sites within a few hundred years because of the necessary corrections for precession, or again to demonstrate the extinction angle of the bright stars as they rose and set.

By a happy chance, Volume 8 begins with an equally readable and enjoyable account of modern astronomy by Prof. Schwarzschild. This is an introduction to the proceedings of a conference held in 1964 in honour of Ejnar Hertzsprung, aged 91 at the time. In the course of 4,000 years positional accuracy has improved from about one quarter of a degree to a few hundredths of a second of arc; one reflects on the continuity of intellectual spirit over so many generations and under such differing conditions.

It is surely the spirit of modern astronomy which inspires Arthur Beer to edit this series. One finds here authoritative reviews, for example, S. W. McCuskey on the stellar luminosity function, or the spectroscopic topics treated by Yoshio Fujita and Margherita Hack, or "Problems of Star Formation", by V. C. Reddish. Again, there are detailed working papers, particularly in the conference report (Volume 8), invaluable to observers and theorists alike.

Neolithic man would have been glad of any means of written communication. We, who can afford to be selective, welcome another two volumes in this most enjoyable and useful series.

F. G. SMITH